

## IN THE CLAIMS

Please amend the claims as follows:

- 1 1. (Withdrawn) A method of p-type doping in ZnO comprising:  
2 forming an acceptor-doped material having ZnO under reducing conditions,  
3 thereby insuring a high donor density; and  
4 annealing the specimens of said acceptor-doped material at intermediate  
5 temperatures under oxidizing conditions so as to remove intrinsic donors and activate  
6 impurity acceptors.
- 1 2. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a  
2 hydrogen containing atmosphere.
- 1 3. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a  
2 non- hydrogen containing atmosphere.
- 1 4. (Withdrawn) The method of claim 1, wherein said acceptor-doped material comprises  
2 a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited  
3 on said n-type ZnO layer.
- 1 5. (Withdrawn) The method of claim 1, wherein said intermediate temperatures  
2 comprise a temperature range between 200 °C and 700 °C.
- 1 6. (Withdrawn) A method of forming p-n junctions using p-type ZnO comprising:  
2 forming an acceptor-doped material having ZnO under reducing conditions,  
3 thereby insuring a high donor density; and

annealing the specimens of said acceptor-doped material at intermediate temperatures under oxidizing conditions so as to remove intrinsic donors and activate impurity acceptors.

7. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a hydrogen containing atmosphere.

8. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a non- hydrogen containing atmosphere.

9. (Withdrawn) The method of claim 6, wherein said acceptor-doped material comprises a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited on said n-type ZnO layer.

10. (Withdrawn) The method of claim 6, wherein said intermediate temperatures comprises a temperature range between 200 °C and 700 °C.

11. (Currently Amended) A wide band gap semiconductor device comprising:

a substrate;

an annealed n-type ZnO layer directly positioned on said substrate, said annealed n-type ZnO layer comprises Ga as a dopant to produce n-type conductivity; and

an annealed p-type ZnO layer directly positioned on said annealed n-type ZnO layer, said annealed p-type ZnO layer comprises nitrogen deposited under hydrogen reducing conditions as a dopant to produce p-type conductivity~~uses an intrinsic donor to increase donor concentration and to obtain high impurity acceptor density of an acceptor doped material, said intrinsic donor is removed during annealing.~~

12. (Previously Presented) The wide band gap semiconductor device of claim 11,  
wherein said acceptor-doped material is exposed to a hydrogen containing atmosphere.

13. (Previously Presented) The wide band gap semiconductor device of claim 11,  
wherein said acceptor-doped material is exposed to a non- hydrogen containing  
atmosphere.

14. (Cancelled).

15. (Cancelled).

16. (Currently Amended) A p-n junction comprising:

a substrate;

an annealed n-type ZnO layer directly positioned on said substrate, said annealed  
n-type ZnO layer comprises Ga as a dopant to produce n-type conductivity; and

an annealed p-type ZnO layer directly positioned on said annealed n-type ZnO  
layer, said annealed p-type ZnO comprises nitrogen deposited under hydrogen reducing  
conditions as a dopant to produce p-type conductivity ~~layer uses an intrinsic donor to  
increase donor concentration as well as high impurity acceptor density of an acceptor  
dope material, said intrinsic donor is removed during annealing.~~

17. (Previously Presented) The p-n junction of claim 16, said acceptor-doped material is  
exposed to a hydrogen containing atmosphere .

18. (Previously Presented) The p-n junction of claim 16, wherein said acceptor-doped  
material is exposed to a non- hydrogen containing atmosphere .

1 19. (Cancelled)

1 20. (Cancelled)